Appendix A

History of the Hatfield/HAI Model

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The Hatfield/HAI Model was originally developed to produce estimates of the TSLRIC of basic local telephone service as part of an examination of the cost of universal service. This original model was a "greenfield" model in that it assumed all network facilities would be built without consideration given to the location of existing wire centers. When the original Benchmark Cost Model ("BCM1")[1] became available, HAI revised the original Hatfield Model to incorporate certain loop investment data produced by BCM1. As a result, the Hatfield Model adopted BCM1's "scorched node" methodology of assuming that network wire centers will remain at their current locations. Investment outputs from the BCM1 loop modeling process, substantially modified by including the cost of items that were not included in the BCM1, were then combined with extensive wire center and interoffice and expense calculations enhanced from the earlier Hatfield Model to develop a complete set of TSLRIC estimates for basic local service.

An expanded version of earlier Hatfield Models, referred to as the Hatfield Model, Version 2.2, Release 1, was developed early in 1996 to estimate the costs of unbundled network elements. It was submitted to the Federal Communications Commission ("FCC") in CC Docket No. 96-98 on May 16 and 30, 1996, accompanied by descriptive documentation.[2] On July 3, 1996, that model was also placed into the record of CC Docket No. 96-45 to assist the Commission in determining the forward-looking economic costs of universal service.[3]

Further enhancements to this model were contained in the Hatfield Model, Version 2.2, Release 2 ("HM 2.2.2"). This version of the model estimated the efficient, forward-looking economic cost of both unbundled network elements and basic local telephone service. HM 2.2.2 derived certain of its inputs and methods from the BCM-PLUS model, a derivative of BCM1 that was developed and copyrighted by MCI Telecommunications Corporation.

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[1] The Benchmark Cost Model is a model of basic local telephone service that was developed by MCI, NYNEX, Sprint, and U S WEST.

[2] See Appendix E of the *Comments* of AT&T in CC Docket No. 96-98, In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, and Appendix D of AT&T's *Reply Comments*. In the same proceeding, MCI submitted results based on an earlier "greenfield" version of the Model as Attachment 1 to its *Comments*.

[3] See FCC Public Notice, DA-96-1078, Released July 3, 1996 and DA 1094, Released July 10, 1996 ("Cost Model Public Notice").

On August 8, 1996, the FCC released its First Report and Order in CC Docket No. 96-98, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, and CC Docket No. 95-185, Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers ("Interconnection Order"). The Interconnection Order provided a comprehensive set of criteria for the arrangements through which the incumbent Local Exchange Carriers (ILECs) would offer unbundled network elements to competitive local exchange carriers (CLECs). The criteria included a definition of a cost-based methodology that should be used in setting the price of unbundled network elements. The methodology was termed the "Total Element Long Run Incremental Cost," or TELRIC. The methodology of the Hatfield Model is fully consistent with the TELRIC principles set forth in the Interconnection Order for calculating the cost of UNEs, and with TSLRIC principles for calculating the cost of Basic Local Service.

AT&T and MCI used HM 2.2.2 as the basis for their recommended prices for unbundled network elements in a large number of state jurisdictions during the latter part of 1996. Its results were adopted in whole or in part in several of these proceedings. In the process, the Model was subject to thorough examination by the ILECs, state commission staffs, and other parties. This scrutiny, along with ongoing intense internal reviews, provided valuable insights into further desirable enhancements to the Model.

On November 8, 1996, the Joint Board issued its Recommended Decision in CC Docket No. 96-45.[4] In addition to defining Universal Service, the Board also addressed the issue of determining the level of support required for universal service. In doing so, it found that:

> . . . a properly crafted proxy model can be used to calculate the forward-looking economic costs for specific geographic areas, and be used as the cost input in determining the level of support a carrier may need to serve a high cost area. The Joint Board therefore recommends that the Commission continue to work with the state commissions to develop an adequate proxy model that can be used to determine the cost of providing supported services in a particular geographic area . . .[5]

An in-depth review of these issues was also provided in the Competitive Pricing Division Staff Analysis of "The Use of Computer Models for Estimating Forward-Looking Economic Costs."[6] Further suggestions for the improvement of proxy models were advanced at workshops conducted by the FCC in cooperation with the Joint Board staff on January 14 and 15, 1997. Although the FCC and state staffs declined at that time to

[4] Op. cit., Recommended Decision.

[5] Ibid., paragraph 268.

[6] Released January, 9, 1997.

recommend any particular proxy model, these workshops provided an extensive review of the existing models, and established a number of criteria these models should meet.[7]

On February 7, 1997, AT&T and MCI submitted to the Joint Board a preliminary version of a new release of the Hatfield Model, Release 3.0, with accompanying documentation. The submission included data and results for five states: California, Colorado, New Jersey, Texas, and Washington.[8] HM 3.0 addressed the concerns raised by the Joint Board in its consideration of proxy cost models and the FCC in its consideration of modeling the forward looking economic cost of interconnection. It was responsive to the principles established and concerns raised about existing models, in the Interconnection Order, the Joint Board Recommendation and in Staff Papers and Workshops.

Later the same month, on February 28, AT&T and MCI submitted Hatfield Model Release 3.1 (HM 3.1). It incorporated certain minor modifications to HM 3.0; further, it contained data for 49 states plus the District of Columbia.

In April, 1997, the state members of the Universal Service Joint Board issued several proxy cost modeling reports. Although these reports provided useful analyses of desired features within the models, they came to no clear final conclusion on the choice of a model.

[7] Ibid., paragraphs 273-277 and Appendix F.

[8] Results from Release 3.0 were submitted in three state proceedings: Kansas, Virginia, and Washington.

Appendix B

HM 5.0a Inputs, Assumptions and Default Values

Appendix B – HAI Model Release 5.0a Inputs, Assumptions and Default Values

This appendix provides a list of the HAI Model Release 5.0a user inputs, as well as their definitions and the default values set in the model. The Appendix is organized based on the series of user input dialogue boxes that are used to set parameters in the HAI Model interface. This yields the following hierarchy:

Input Parameter Category (distribution, feeder, wire center, expense, and excavation)
Category dialogue box (NID, drop, switching parameters, etc.)
User Input field (fiber strands per remote terminal, etc.)

The appendix is organized into two sections. The first contains the index of dialogue boxes and specific user input fields. The second lists the inputs with their definitions and default values. These are numbered sequentially from B1 through B201. To facilitate cross-referencing between the two sections, each user-input field in the first section contains a numbered entry from the second section. Thus, for instance, the "B1" next to the Residential NID Materials, No Protector entry refers to the first item in the second section of the appendix.

With this organization, the appendix allows a user who is examining a given user input dialogue box and specific user input field to locate that box/field in the index in the first section, read the number of the corresponding input definition, and use that number to locate the input definition and default value in the second section.

Note that a few parameters are set in one module but used by several modules. In such cases, the parameter appears only once, but its use in other modules is noted at the end of each input parameter category in this index.

PART 1: INDEX OF DIALOGUE BOXES AND USER INPUT FIELDS

Distribution

NID

B1	Residential NID Case, no protector
B1	Residential NID Basic Labor
B1	Residential Protection Block, per pair
B1	Business NID Case, no protector
B1	Business NID Basis Labor
B1	Business Protection Block, per pair
B1	Indoor NID Case

Drop

B2	Drop Distance
B3	Aerial Drop Installation, total
B3	Buried Drop Installation/foot
B4	Buried Drop Sharing Fraction
B5	Buried Drop Fraction
B6	Average Lines Per Business Locations
B7	Buried Terminal and Splice per Line
B7	Aerial Terminal and Splice per Line
B8	Buried Drop Investment per Foot
B8	Aerial Drop Investment per Foot
B8	Buried Pairs
B8	Aerial Pairs

Cable and Riser Investment

B9	Distribution Cable Size
B10	Distribution Cable, $/foot
B11	Riser Cable Size
B11	Riser Cable, $/foot

Poles and Conduit

B12	Pole Investment
B12	Pole Labor
B13	Buried Cable Sheath Multiplier
B14	Conduit Investment per Foot
B15	Spare Tubes per Route
B16	Regional Labor Adjustment Factor (Note: This parameter can now be found after the Excavation and Restoration section, at the end of this document.)

Placement Fraction

B17	Aerial Fraction
B17	Buried Fraction
B17	Underground Fraction
B17	Buried Fraction Available for Shift

Cable Sizing Factors and Pole Spacing

B18	Cable Sizing Factors
B19	Pole Spacing

Geology and Clusters

B20	Difficult Terrain Distance Multiplier
B21	Rock Depth Threshold, inches
B22	Hard Rock Placement Multiplier
B23	Soft Rock Placement Multiplier
B24	Sidewalk / Street Fraction
B25	Maximum Analog Copper Total Distance
B26	Feeder Steering Enable
B27	Maximum Feeder Route/Air Multiplier
B27a	Require Serving Areas to be Square

Long Loop Investments

B28	T1 Repeater Investments, Installed
B29	CO Mux Capacity, Installed
B30	RT Cabinet & Common Equipment, Installed
B31	T1 Channel Unit Investment per Subscriber
B32	COT Investment per RT, Installed
B33	T1 Remote Terminal Fill Factor
B34	Maximum T1s per Cable
B35	T1 Repeater Spacing
B36	Aerial T1 Attenuation
B37	Buried T1 Attenuation

SAI Investment

B38	Cable Size
B38	Indoor SAI
B38	Outdoor SAI

Dedicated Circuit Inputs

B39	Percentage of Dedicated Circuits
B40	Pairs per Dedicated Circuit

Wireless Investment

B41	Wireless Investment Cap Enable
B42	Wireless Point to Point Investment Cap - Distribution
B43	Wireless Common Investment
B44	Wireless Per Line Investment
B45	Maximum Broadcast Lines per Common Investment

Feeder

Copper Placement

B46	Aerial Fraction
B46	Buried Fraction
B46	Underground Fraction
B47	Manhole Spacing, /ft.
B48	Pole Spacing, ft.
B49	Pole Materials

B49	Pole Labor
B50	Inner Duct Investment per Foot

Fiber Placement

B51	Aerial Fraction
B51	Buried Fraction
B51	Underground Fraction
B51	Buried Fraction Available for Shift
B52	Pullbox Spacing, ft.
B53	Buried Fiber Sheath Addition per Foot

Cable Sizing Factors

B54	Copper Feeder Cable Sizing Factors
B55	Fiber Feeder Cable Sizing Factor

Cable Costs

B56	Copper Investment per foot
B56	Copper Investment per Pair-foot
B57	Fiber Investment per foot
B57	Fiber Investment per Strand-foot

DLC Equipment

B58	High Density DLC Remote Terminal – Site and Power
B58	Low Density DLC Remote Terminal – Site and Power
B59	High Density DLC Remote Terminal – Maximum Lines
B59	Low Density DLC Remote Terminal – Maximum Lines
B60	High Density DLC Remote Terminal – RT Fill Factor
B60	Low Density DLC Remote Terminal – RT Fill Factor
B61	High Density DLC Remote Terminal – Common Equipment Investment
B61	Low Density DLC Remote Terminal – Common Equipment Investment
B62	High Density DLC Remote Terminal – POTS Channel Unit Investment
B62	Low Density DLC Remote Terminal – POTS Channel Unit Investment
B62	High Density DLC Remote Terminal – Coin Channel Unit Investment
B62	Low Density DLC Remote Terminal – Coin Channel Unit Investment
B63	High Density DLC Remote Terminal – POTS Lines per CU
B63	Low Density DLC Remote Terminal – POTS Lines per CU
B63	High Density DLC Remote Terminal – Coin Lines per CU
B63	Low Density DLC Remote Terminal – Coin Lines per CU
B64	LD Crossover Lines
B65	High Density DLC Remote Terminal – Fibers per RT
B65	Low Density DLC Remote Terminal – Fibers per RT
B66	High Density DLC Remote Terminal – Optical Patch Panel
B66	Low Density DLC Remote Terminal – Optical Patch Panel
B67	Copper Feeder Max Distance, ft
B68	High Density DLC Remote Terminal – Common Equipment Investment per 672 Lines
B68	Low Density DLC Remote Terminal – Common Equipment Investment per 120 Lines
B69	High Density DLC Remote Terminal – Number of Max Line Modules / RT
B69	Low Density DLC Remote Terminal – Number of Max Line Modules /

RT

Copper Manhole Investment

B70	Materials
B70	Frame and Cover
B70	Site Delivery
B70	Excavate and Backfill
B71	Dewatering Factor for Manhole Placement
B72	Water Table Depth for Dewatering

Fiber Pullbox Investment

B73	Materials
B73	Installation

Note: The Feeder Module also uses inputs B13-B15.

Switching and Interoffice Transmission

End Office Switching

B74	Real time (BHCA)
B75	Traffic (BHCCS)
B76	Switch maximum line size
B77	Switch port administrative fill
B78	Switch maximum processor occupancy
B79	MDF/protector investment per line
B80	Analog line circuit offset of DLC per line
B81	Switch installation multiplier
B82	End Office Switching Investment Constant – BOC and Large ICO
B82	End Office Switching Investment Constant – Small ICO
B83	End Office Switching Investment Slope Term
B84	Processor Feature Loading Multiplier - Normal
B84	Processor Feature Loading Multiplier - Heavy business
B85	Processor Feature Loading Multiplier - Business penetration threshold

Wire Center

B86	Lot size, multiplier of switch room size
B87	Tandem/EO common factor
B88	Power
B89	Switch Room Size, square ft.
B90	Construction, square ft.
B91	Land, square ft.

Traffic Parameters

B92	Local Call Attempts
B93	Call Completion Factor
B94	IntraLATA Calls Completed
B95	InterLATA Intrastate Calls Completed
B96	InterLATA Interstate Calls Completed
B97	Local DEMs, thousands
B98	Intrastate DEMs, thousands

B99	Interstate DEMs, thousands
B100	Local Business/Residential DEMs
B101	Intrastate Business/Residential DEMs
B102	Interstate Business/Residential DEMs
B103	BH Fraction of Daily Usage
B104	Annual to Daily Usage Reduction Factor
B105	Residential Holding Time Multiplier
B105	Business Holding Time Multiplier
B106	Residential Call Attempts/BH
B106	Business Call Attempts/BH

Interoffice Investment

B107	OC-48 ADM, installed, 48 DS-3s
B107	OC-48 ADM, installed, 12 DS-3s
B107	OC-3/DS-1 Terminal Multiplexer, installed, 84 DS-1s
B107	Investment per 7 DS-1s
B108	Number of Fibers
B109	Pigtail Investment
B110	Optical Distribution Panel
B111	EF&I, per hour
B112	EF&I, hours
B113	Regenerator, installed
B114	Regenerator Spacing, miles
B115	Channel Bank Investment/24 lines
B116	Fraction of SA lines requiring multiplexing
B117	Digital Cross Connect System, installed per DS3
B118	Transmission Terminal Fill (DS-0 level)
B119	Fiber Cable
B120	Number of Strands per ADM
B121	Buried Fraction
B121	Aerial Fraction
B122	Buried Placement
B122	Conduit Placement
B123	Buried Sheath Addition
B124	Conduit
B125	Pullbox Spacing
B126	Spare Tubes per route
B126	Pullbox Investment
B127	Pole Spacing, ft.
B128	Pole Material
B128	Pole Labor
B129	Fraction of poles and buried/underground placement common with feeder
B130	Fraction of aerial structure assigned to telephone
B130	Fraction of buried structure assigned to telephone
B130	Fraction of underground structure assigned to telephone

Transmission Parameters

B131	Operator Traffic Fraction
B132	Total Interoffice Traffic Fraction
B133	Maximum Trunk Occupancy, CCS
B134	Trunk Port, per end
B135	Direct Routed fraction of local interoffice

B136	Tandem Routed fraction of intraLATA traffic
B137	Tandem Routed fraction of interLATA traffic
B138	POPs per Tandem Location
B139	Threshold Value for Off-Ring Wire Centers
B140	Remote – Host Fraction of Interoffice Traffic
B141	Host – Remote Fraction of Interoffice Traffic
B142	Maximum Nodes per Ring
B142a	Ring Transiting Traffic Factor
B142b	Intertandem Fraction of Tandem Trunks

Tandem Switching

B143	Real Time Limit, BHCA
B144	Port Limit, trunks
B145	Common Equipment Investment
B146	Maximum Trunk Fill
B147	Maximum Real Time Occupancy
B148	Common Equipment Intercept Factor
B149	Entrance Facility Distance from Serving Wire Center & IXC POP

Signaling

B150	STP Link Capacity
B151	STP Maximum Fill
B152	STP investment, per pair, maximum
B153	STP investment, per pair, minimum
B154	Link Termination, both ends
B155	Signaling Bit Rate
B156	Link Occupancy
B157	C Link Cross Section
B158	ISUP Messages per interoffice BHCA
B159	ISUP Messages length, bytes
B160	TCAP Messages per transaction
B161	TCAP Message Length, bytes
B162	Fraction of BHCA requiring TCAP
B163	SCP investment/transaction/second

OS and Public Telephone

B164	Investment per position
B165	Maximum Utilization per position, CCS
B166	Operator Intervention Factor
B167	Public Telephone Equipment Investment, per station

ICO Parameters

B168	ICO STP Investment per line, Equipment
B169	ICO Local Tandem Investment per line, Equipment
B170	ICO OS Tandem Investment per line, Equipment
B171	ICO SCP Investment per line, Equipment
B172	ICO STP/SCP Wire Center Investment per line
B173	ICO Local Tandem Wire Center Investment per line
B174	ICO OS Tandem Wire Center Investment per line
B175	ICO C-Link / Tandem A-Link Investment per line
B175a	Equivalent Facility Investment per DS0
B175b	Equivalent Terminal Investment per DS0

Host / Remote Assignment

B176	Host – Remote CLLI Assignments
B177	Host – Remote Assignment Flag

Host / Remote Investment

B177a	Line Size Designation
B177b	Fixed and per Line Investment

Expense

Cost of Capital

B178	Cost of Debt
B178	Debt Fraction
B178	Cost of Equity

Depreciation and Net Salvage

B179	Motor Vehicles
B179	Garage Work Equipment
B179	Other Work Equipment
B179	Buildings
B179	Furniture
B179	Office Support Equipment
B179	Company Comm. Equipment
B179	General Purpose Computer
B179	Digital Electronic Switching
B179	Operator Systems
B179	Digital Circuit Equipment
B179	Public Telephone Terminal Equipment
B179	Poles
B179	Aerial Cable – metallic
B179	Aerial Cable – non metallic
B179	Underground Cable – metallic
B179	Underground Cable – non metallic
B179	Buried Cable – metallic
B179	Buried Cable – non metallic
B179	Intrabuilding Cable – metallic
B179	Intrabuilding Cable – non metallic
B179	Conduit Systems

Expense Assignment

B179a	Furniture – Capital Costs
B179a	Furniture – Expenses
B179a	Office Equipment – Capital Costs
B179a	Office Equipment – Expenses
B179a	General Purpose Computer – Capital Costs
B179a	General Purpose Computer – Expenses
B179a	Motor Vehicles – Capital Costs
B179a	Motor Vehicles – Expenses
B179a	Buildings – Capital Costs
B179a	Buildings – Expenses

B179a	Garage Work Equipment – Capital Costs
B179a	Garage Work Equipment – Expenses
B179a	Other Work Equipment – Capital Costs
B179a	Other Work Equipment – Expenses
B179a	Network Operations
B179a	Other Taxes
B179a	Variable Overhead

Structure Fraction Assigned to Telephone

B180	Distribution Aerial
B180	Distribution Buried
B180	Distribution Underground
B180	Feeder Aerial
B180	Feeder Buried
B180	Feeder Underground

Other

B181	Income Tax Rate
B182	Corporate Overhead Factor
B183	Other Taxes Factor
B184	Billing/Bill Inquiry per line per month
B185	Directory Listing per line per month
B186	Forward-looking Network Operations Factor
B187	Alternative CO Switching Factor
B188	Alternative Circuit Equipment Factor
B189	EO Non Line-Port Cost Fraction
B190	Per line monthly LNP cost
B191	Carrier – Carrier Customer Service, per line per year
B192	NID Expense per line per year
B193	DS-0/DS-1 Terminal factor
B194	DS-1/DS-3 Terminal factor
B195	Average Lines per Business Location
B196	Average Trunk Utilization

Excavation and Restoration

Underground Excavation

B197	Trenching, per Foot
B197	Backhoe Fraction
B197	Backhoe Cost, per Foot
B197	Hand Trench Fraction
B197	Hand Trench Cost per Foot

Underground Restoration

B198	Cut/Restore Asphalt Fraction
B198	Cut/Restore Asphalt, per Foot
B198	Cut/Restore Concrete Fraction
B198	Cut/Restore Concrete, per Foot
B198	Cut/Restore Sod Fraction
B198	Cut/Restore Sod, per Foot
B198	Simple Backfill, per Foot

B198	Pavement, per Foot
B198	Dirt, per Foot

Buried Excavation

B199	Plow Fraction
B199	Plow per Foot
B199	Trench per Foot
B199	Backhoe Fraction
B199	Backhoe, per Foot
B199	Hand Trench Fraction
B199	Hand Trench, per Foot
B199	Bore Cable Fraction
B199	Bore Cable, per Foot

Buried Installation and Restoration

B200	Push Pipe/Pull Cable Fraction
B200	Push Pipe/Pull Cable per Foot
B200	Cut/Restore Asphalt Fraction
B200	Cut/Restore Asphalt, per Foot
B200	Cut/Restore Concrete Fraction
B200	Cut/Restore Concrete, per Foot
B200	Cut/Restore Sod Fraction
B200	Cut/Restore Sod, per Foot
B200	Restoral Not Required
B200	Simple Backfill

Surface Texture

B201	Percent of cluster Likely Affected and Effect of Texture Code

Labor Adjustment Factors

Labor Adjustment Factor

B16	Regional Labor Factor

Labor Adjustment Factor Weightings

B16a	Contractor Excavation and Restoration
B16a	Telco Construction – Copper
B16a	Telco Construction – Fiber
B16a	Telco Drop/NID Installation and Maintenance
B16a	Contractor Pole Setting

PART 2: INPUT PARAMETER DEFINITIONS AND DEFAULT VALUES

DISTRIBUTION INPUT PARAMETERS

NETWORK INTERFACE DEVICE

B1. NID Investment per line

Definition

The investment in the components of the network interface device (NID), the device at the customers' premises within which the drop wire terminates, and which is the point of subscriber demarcation. The NID investment is calculated as the cost of the NID case plus the product of the protection block cost per line and the number of lines terminated.

Default Values

NID Materials and Installation	
	Costs
Residential NID case, no protector	$10.00
Residential NID basic labor	$15.00
Installed NID case	*$25.00*
Protection block, per line	$4.00
Business NID case, no protector	$25.00
Business NID basic labor	$15.00
Installed NID case	*$40.00*
Protection block, per line	$4.00
Indoor NID Case	$5.00

DROP

B2. Drop Distance

Definition

The average length of a drop cable in each of nine density zones. The drop extends from the NID at the customer's premises to the block terminal at the distribution cable that runs along the street or the lot line.

Default Values

Drop Distance by Density	
Density Zone	**Drop Distance, feet**
0-5	150
5-100	150
100-200	100
200-650	100
650-850	50
850-2,550	50
2,550-5,000	50
5,000-10,000	50
10,000+	50

B3. Drop Placement, Aerial and Buried

Definition

The total placement cost by density zone of an aerial drop wire, and the cost per foot for buried distribution cable placement, respectively.

Default Values

Drop Placement, Aerial & Buried		
Density Zone	**Aerial, total**	**Buried, per foot**
0-5	$23.33	$0.60
5-100	$23.33	$0.60
100-200	$17.50	$0.60
200-650	$17.50	$0.60
650-850	$11.67	$0.60
850-2,550	$11.67	$0.60
2,550-5,000	$11.67	$0.75
5,000-10,000	$11.67	$1.50
10,000+	$11.67	$5.00

B4. Buried Drop Sharing Fraction

Definition

The fraction of buried drop cost that is assigned to the telephone company. The other portion of the cost is borne by other utilities.

Default Value

Buried Drop Sharing Fraction	
Density Zone	**Fraction**
0-5	.50
5-100	.50
100-200	.50
200-650	.50
650-850	.50
850-2,550	.50
2,550-5,000	.50
5,000-10,000	.50
10,000+	.50

B5. Drop Structure Fractions

Definition

The percentage of drops that are aerial and buried, respectively, as a function of density zone.

Default values

Drop Structure Fractions		
Density Zone	**Aerial**	**Buried**
0-5	.25	.75
5-100	.25	.75
100-200	.25	.75
200-650	.30	.70
650-850	.30	.70
850-2,550	.30	.70
2,550-5,000	.30	.70
5,000-10,000	.60	.40
10,000+	.85	.15

B6. Number of Lines per Business Location

Definition

The average number of business lines per business location, used to calculate NID and drop cost. This parameter should be set the same as Parameter B195.

Default Value

B7. Terminal and Splice Investment per line

Definition

The installed cost per line for the terminal and splice that connect the drop to the distribution cable.

Default Value

Terminal and Splice Investment per Line	
Buried	**Aerial**
$42.50	$32.00

B8. Drop Cable Investment, per foot and Pairs per Wire

Definition

The investment per foot required for aerial and buried drop wire, and the number of pairs in each type of drop wire.

Default Values

Drop Cable Investment, per foot		
	Material Cost Per foot	**Pairs**
Buried	$0.140	3
Aerial	$0.095	2

CABLE AND RISER INVESTMENT

B9. Distribution Cable Sizes

Definition

Cable sizes used for distribution cable variables (in pairs).

Default Values

Cable Sizes
2400
1800
1200
900
600
400
200
100
50
25
12
6

B10. Copper Distribution Cable, $/foot

Definition

The cost per foot of copper distribution cable, as a function of cable size, including the costs of engineering, installation, and delivery, as well as the cable material itself.

Default Values

Copper Distribution Cable, $/foot	
Cable Size	**Cost/foot (including engineering, installation, delivery and material)**
2400	$20.00
1800	$16.00
1200	$12.00
900	$10.00
600	$7.75
400	$6.00
200	$4.25
100	$2.50
50	$1.63
25	$1.19
12	$0.76
6	$0.63

B11. Riser Cable, $/foot

Definition

The cost per foot of copper riser cable (cable inside high-rise buildings), as a function of cable size, including the costs of engineering, installation, and delivery, as well as the cable material itself.

Default Values

Riser Cable, $/foot	
Cable Size	**Cost/foot (including engineering, installation, delivery and material)**
2400	$25.00
1800	$20.00
1200	$15.00
900	$12.50
600	$10.00
400	$7.50
200	$5.30
100	$3.15
50	$2.05
25	$1.50
12	$0.95
6	$0.80

POLES AND CONDUIT

B12. Pole Investment

Definition

The installed cost of a 40-foot Class 4 treated southern pine utility pole

Default Value

Pole Investment	
Materials	$201
Labor	$216
Total	*$417*

B13. Buried Copper Cable Sheath Multiplier (feeder and distribution)

Definition

The additional cost of the filling compound used in buried cable to protect the cable from moisture expressed as a multiplier of the cost of non-filled cable.

Default value

1.04

B14. Conduit Material Investment per foot

Definition

Material cost per foot for 4" PVC.

Default Value

$0.60

B15. Spare Tubes per Route (distribution)

Definition

The number of spare tubes (i.e., conduit) placed per route.

Default Value

1

B16. Regional Labor Adjustment Factor (moved to the end of this document)

Note: This parameter is moved to the end of the document, page 77.

PLACEMENT FRACTION

B17. Distribution Structure Fractions

Definition

The distribution cable structure fractions are the relative amounts of different structure types supporting distribution cable in each density zone. Aerial distribution cable is attached to telephone poles or buildings, buried cable is laid directly in the earth, and underground cable runs through underground conduit. In the highest two density zones, aerial structure includes riser and block cable.

The buried fraction available for shift parameter is defined as the fraction of buried cable input value that is available to be shifted to aerial or the fraction of the input value by which the amount of buried cable can increase. If, for example, the user has entered an initial value of 0.5 for the buried cable fraction in a given density zone and then enters 0.6 as the buried fraction available for shift, the model can allow the computed buried fraction (according to local surface and bedrock conditions) to vary up or down by 0.3 (60% of 0.5), and thus lie between 0.2 and 0.8. Separate values must be entered for each density range, and the computed fraction of buried cable is not allowed by the model to exceed 1.0. Note that the parameter and associated process are applied to both distribution and feeder cable.